

<b>Institution:</b> Edinburgh Napier University		
<b>Unit of Assessment:</b> Unit of Assessment 20 – Social Work and Social Policy		
<b>Title of case study:</b> Equate Scotland: Encouraging Women in the Scottish STEM Sector		
<b>Period when the underpinning research was undertaken:</b> January 2010 - December 2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Kiril Sharapov	<b>Role(s) (e.g. job title):</b> Research Fellow (Equate), Associate Professor	<b>Period(s) employed by submitting HEI:</b> May 2007 - July 2010, April 2017 - Current
Talat Yaqoob	Director of Equate (Edinburgh Napier University Employee)	January 2016 - May 2020
Kirstie Farmer	Project Officer / Training and Development Manager Equate (Edinburgh Napier University Employee)	October 2016 - December 2020
Aileen O'Hagen	Industry Recruitment Coordinator Equate (Edinburgh Napier University Employee)	2018 - Current
<b>Period when the claimed impact occurred:</b> October 2015 - March 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<p><b>1. Summary of the impact</b> (indicative maximum 100 words)</p> <p>In Scotland, only 30% of women who graduate with a qualification in STEM (science, technology, engineering and mathematics) work in the sector long term. Research by Equate Scotland, a department at Edinburgh Napier University (ENU), has investigated the barriers that prevent women progressing in STEM education and careers. It has recommended holistic approaches to increasing female engagement, employment and retention that have been implemented across the sector.</p> <p>Research has directly influenced Scottish Government flagship policies on education and employment, and has underpinned improvements in the practices of national organisations (Skills Development Scotland and Scottish Engineering). It has also informed educational establishments such as The Open University and City of Glasgow College, where the proportion of women studying engineering rose from 4% to 28%.</p> <p>Equate has developed new pathways for women to engage in the STEM sector. Work with employers, including the video games company FanDuel, led to a new diversity and inclusion policy.</p>		
<p><b>2. Underpinning research</b> (indicative maximum 500 words)</p> <p>Only 25% of employees in the Scottish STEM sector are women. Despite young boys and girls having an equal interest in science and technology, boys are more likely to pursue related subjects. Among the women who do progress to university and qualify in STEM subjects, only 30% plan to remain in the sector long term, and of these 30%, very few make it to senior roles. Many who rise this high continue to report an unequal and inflexible working environment. Not only an issue of diversity, the drop-out rate of women from STEM constitutes a significant brain drain for the sector. How will Scotland reach its innovation targets whilst under-using half of its population?</p>		

Established in 2006, Equate Scotland (formerly the Scottish Resource Centre for Women in Science, Engineering and Technology) is a distinct department at ENU, and is the expert group in gender equality in the Scottish STEM sector. Under the University's oversight, the Equate team seeks Scottish Government funding to provide support without charge to women and employers in STEM. Equate provides a knowledgeable and sector-facing group which understands and supports the needs of the sector as effectively as possible. Talat Yaqoob, Kirstie Farmer, and Aileen O'Hagan have been employed by the University in different roles in the department, both to oversee day to day sector support, and to undertake applied research. Dr Sharapov is an ENU Associate Professor, who worked with Equate between 2007-2010. In the REF period, Equate has used a research-led approach to understand and solve the problems affecting female progression in STEM. Although led by individuals, all research has been performed collaboratively by the Equate team as a single department.

In 2009, Equate was commissioned by ConstructionSkills Scotland (the training board for the construction industry) to investigate problems in attracting girls and women into construction apprenticeships (Sharapov) [O1]. Surveys of over 200 apprentices, education lecturers and employers, and a statistical analysis of datasets provided by the Scottish Funding Council, found that only 2% of Scottish construction apprentices were female. This contrasted with an average of 48% in other sectors. The project led to recommendations to help reduce this disparity in future. These included an increase in pre-apprenticeship work experience opportunities, and further support and encouragement from schools and colleges, solutions later reiterated by the Scottish Government in a 2013 review of gender segregation.

Between 2013 and 2020, Equate was funded by the Scottish Government to run a project called *Careerwise*. This encouraged STEM employers to create paid 8-12-week work placements for women studying STEM subjects at Scottish universities. Equate undertook a three-year evaluation of the project (2017) in order to identify the strengths of this approach for supporting women in STEM [O2]. Telephone interviews and surveys were undertaken with 141 apprentices, 52 employers, 22 lecturers and 93 students. The study found that high quality placements for female students with STEM employers strongly benefitted both parties. The scheme was found to increase productivity for employers, as well as improving their profile amongst students, but most importantly, it increased their likelihood of recruiting talented female employees. Female students were found to experience placements very positively, with 95% noting improved confidence following placements, and 90% on average saying placements made them more intent on pursuing a career in STEM.

In 2016, the Scottish Government funded Equate to undertake a sector-wide stakeholder analysis on the future of women in STEM in Scotland. Over 1,000 individuals including young people, women students in STEM subjects, women working in STEM, educators and employers were surveyed. This created a robust qualitative data set [O3] on what the sector required to address the gender imbalance. The study found clear recognition by the sector of the problems associated with female recruitment and retention. It also recommended strategies for improvement, which were gathered from the key stakeholders. These included STEM ambassadors in schools, more student placements and unconscious bias training for industry.

Equate has since (2017-19) used a similar approach to analyse and support specific STEM industries to understand the problems they experience and suggest solutions for increasing the level of female representation. Best practice guides were prepared for STEM companies in the technology [O4] and construction sectors [O5], which identified sector-specific recommendations for them to increase their recruitment and retention of female staff.

### 3. References to the research (indicative maximum of six references)

**O1** was directly funded by ConstructionSkills Scotland, and **O2** and **O3** by the Scottish Government. All three outputs directly informed Scottish Government policy. **O4** and **O5** have informed practices of a number of high-profile businesses.

- [O1] Sharapov K. Tizard, J. (2011). *Getting in, Getting on...in Construction: Modern*

*Apprentices in Scotland*. Report. <https://www.napier.ac.uk/~media/worktribe/output-838293/getting-in-getting-on-in-construction.pdf>

- [O2] **Equate Scotland**. (2017). *Careerwise: A 3 Year Project Review*. Report. <https://equatescotland.org.uk/wp-content/uploads/2017/07/Careerwise-3-Year-Review-rfw.pdf>

- [O3] **Yaqoob, Talat**. (2016). *10 Years of Equate Scotland. Rising to the Challenge - How Scotland can recruit, retain and support women in STEM*. Report. <https://equatescotland.org.uk/wp-content/uploads/2018/05/ENU00170-10-Years-of-Equate-AW-52pp-FINAL.pdf>

[O4] **Farmer, K. Yaqoob, T.** (2017). *Tackling the Technology Gap Together – A Best Practice Guide for Employers*. Resource. <https://equatescotland.org.uk/wp-content/uploads/2018/05/TTGGT-reviewed-MAY-2018-FINAL-Guide-3.pdf>

- [O5] **O’Hagan, A.** (2019). *Inclusive Value – Industry Guide for the Construction Sector*. Resource. <https://equatescotland.org.uk/wp-content/uploads/2020/05/Industry-Guide.pdf>

#### 4. Details of the impact (indicative maximum 750 words)

The beneficiaries of the research include the Scottish Government, national employment and industry organisations, large businesses and educational institutions, and female STEM students and employees. The *Careerwise* initiative [O2] and the *Rising to the Challenge* research [O3] identified pathways to improve recruitment and retention of women in STEM, and similar studies into the sectors of technology [O4], and construction [O1, O5] provided Equate with the expertise to directly support STEM employers.

The impacts can be summarized under four headings:

- A. Influencing Scottish Government education and employment policy
- B. Developing best practice for Scottish employment and industry organisations
- C. Enabling STEM employers and education organisations
- D. Influencing female students and employees to study and work in STEM

##### A. Influencing Scottish Government education and employment policy

Equate research has directly influenced Scottish Government policy. The “*Getting in, getting on*” modern apprenticeships report [O1] was cited in the Scottish Government’s equality impact assessment of its 2014 *Developing the Young Workforce* policy, which confirmed “*gender segregation within some frameworks remains very significant*” and recommended “*Skills Development Scotland should develop an action plan to address gender disparities within modern apprenticeships*” [C1]. After the *Developing the Young Workforce* policy was published, the *Careerwise* initiative [O2] was piloted by Equate. In 2015, the Cabinet Secretary for Fair Work, Skills and Training announced an extension to the project, saying “*The Careerwise programme has made a considerable impact over the last 18 months*” [C2].

The *Rising to the Challenge* report [O3] was provided to every MSP for Scottish Government consultations. It was cited in a Scottish parliamentary debate in 2016 and in an *Economy, Fair Work and Society* committee meeting in 2017. It was also used to develop the Scottish Government’s 2017 STEM education and skills strategy, where it is cited under section 4.4 *Workplace Demographics* [C3]. In response to its publication in 2016, the First Minister stated “*Equate Scotland has done a huge amount of work [...] to encourage more women to study and pursue careers in STEM subjects. Their report shows that women [...] still face barriers.*” [C4]. The head of the equality unit at the Scottish Government wrote “*what Equate does influences our ministers and policies. [...] Equate is hosted within Napier University and, as such, has credibility [...] Overall [...] Equate has influenced the Scottish Government and [...] that has evolved into policy/strategy and gone on to delivery*” [C5].

##### B. Developing best practice for Scottish employment and industry organisations

Skills Development Scotland (SDS) is a company which works directly with the Scottish Government to support national employment objectives. Equate worked with SDS to run the *Careerwise* programme (which was evaluated in 2016 but still operates) [O2] and also supports them in developing further peer networks, workshops and training materials. The External Equality Advisor of the SDS National Training Programme noted “*Equate got involved in*

*establishing peer networks [...] whilst originally it was mentoring it then included workshops, helping to develop the apprentice's networks and skills [...] Our team rely on support and advice from Equate" [C6].* Equate also supported SDS in nationwide initiatives to tackle problems in the technology sector.

Equate also utilised its research-led expertise to support Scottish Engineering, Scotland's largest industry organisation. A representative noted "*Scottish Engineering's number one problem is skill shortages. It was not difficult to identify that one of the ways to address skills shortages was to get more women in the sector [...] [Equate] came up with a proposal. [...] to tackle the issue head on and to produce training materials for manufacturing companies, which tackled diversity, inclusion and unconscious bias [...] We ran [eight] sessions [...] in total, with over 70 attendees from business. [...] I believe these sessions were eyeopeners and a call to action for many enterprises. The feedback I got from attendees was incredibly positive. An outcome of this meeting was formation of a quarterly Women's Engineering Breakfast" [C7].*

### **C. Enabling STEM employers and educational organisations**

The *Careerwise* initiative [O2] engaged 33 employers in the Scottish STEM sector and has given businesses the opportunity to recruit key young staff that they may otherwise have missed. As a result of the initiative over 10% of placements led to a return or job offer. It also provided industry sectors with a customized framework through which they could encourage young women to continue their STEM career. One partner at AeCom (an infrastructure firm) stated "*This scheme allows us to actively encourage females to enter this profession by demonstrating opportunities available to them" [O2].* Equate also supported the international gaming company FanDuel Group. It employs 14,000 people and runs a number of high-profile UK-based companies with a significant number of engineers. The HR manager stated "*The relationship started back in late 2016/early [2017] [...] We [...] start[ed] to think about the construction of a FanDuel Group Diversity and Inclusion Strategy [...] I have sought Equate's advice on things such as gender equality when recruiting and how we organise ourselves internally [...] we are better equipped and understand the values of a better gender balance, possibly at all levels" [C8].*

Equate supported The Open University (OU) in a review of the equality of its approaches to recruitment. A senior marketing manager from OU Scotland stated "*initial interest was to get support and advice from Equate to drive forward the Gender Action Plan [...] We contacted Equate and asked them to undertake an independent review of our STEM prospectuses and online content [...] Those lessons picked up by The Open University Central Web Team who still apply the learning [...] Implementing the advice from Equate Scotland in relation to a number of our social campaigns [...] has resulted in significant increases in performance. We have been able to generate much higher levels of enquiry with a lower Cost per Enquiry [...] we increased performance for the STEM campaigns by +45% driving over 1,000 enquiries " [C9].*

Equate worked closely with the City of Glasgow College. The former STEM head at the college, (and now CEO of the Construction Scotland Innovation Centre), stated "*We were keen to have a Positive Action Programme within Engineering. Here, Equate helped us in preparing the college to be more aware and actionable [...] we took our female participation from 8% to 22% [...] In terms of the construction sector, we had greater success taking our numbers from 4% to 28% [C10].* The current Equate champion at the college stated "*As a College we have almost 32,000 students coming from 148 different countries. [...] Equate is now in its third year of delivery [...] guided by Equate, [we] try to do things innovatively/differently [...] We recently attended The Herald Pioneer Awards in Glasgow and the College won an award. This type of work would not happen without the support of Equate. [...] We are now witnessing, either directly from students or family members, an increase of female student enquiring about STEM subjects." [C11].*

### **D. Influencing female students and employees to study and work in STEM**

Equate undertakes initiatives and training courses that support women to progress or remain in STEM. The *Careerwise* initiative [O2] positively influenced students and increased retention rates for those who participated in it. 95% of the students over the first three years confirmed

they felt more confident in the profession as a result of the placement, and 37% of these went on to work in a STEM role. 22% remained in higher education. This means 59% of women who undertook placements remained in STEM, which is much higher than the 30% sector average.

In 2018 Equate began a programme to support experienced women in returning to a career in STEM to address highlighted issues with retention [O3]. 60% of the 20 attendees were successful in undertaking a placement or further STEM education. An engineering employee who attended, now working for Scottish Power stated “*I attended the course for Women Returners back in 2016. [...] I had a career break where I had two children. [...] When I looked at returning, which is very daunting, I came across the Women Returners programme and it appeared to answer all the questions I had. I was on the course for just shy of 12 months and it did not disappoint [...] I was encouraged to apply for a position at Scottish Power, who signed up nine returners in 2019 [...] I think the project did a very good job in preparing us to return to work.*” [C12].

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

[C1] “Getting in, getting on” report referenced in the Scottish Government’s Equality Impact Assessment Record of its ‘Developing the Young Workforce (DYW)’ policy (2017). Page 6.

<https://www.gov.scot/binaries/content/documents/govscot/publications/impact-assessment/2017/12/developing-young-workforce-equality-impact-assessment/documents/00529322-pdf/00529322-pdf/govscot%3Adocument/00529322.pdf>

[C2] Careerwise Article – Comments from Scottish Government

<https://www.webarchive.org.uk/wayback/archive/20180530015233/https://news.gov.scot/news/support-for-female-apprenticeships>

[C3] Scottish Government STEM Education and Training Strategy (2017)

<https://www.gov.scot/publications/science-technology-engineering-mathematics-education-training-strategy-scotland/>

[C4] Quote from the First Minister of Scotland <https://equatescotland.org.uk/first-minister-pledges-support-equate-scotlands-work/>

[C5] Testimonial from Head of Equality Unit – The Scottish Government

[C6] Testimonial from Skills Development Scotland

[C7] Testimonial from Scottish Engineering

[C8] Testimonial from HR Manager FanDuel Group

[C9] Testimonial from Senior Marketing Manager – The Open University Scotland

[C10] Testimonial from Construction Scotland Innovation Centre

[C11] Testimonial from City of Glasgow College

[C12] Testimonial from Female Scottish Power Employee